

Annual Summary of Specified Gas Emitters Regulation:
2007 - 2008

Alberta's Story: Reducing Emissions from a Global Energy Supplier



Alberta emits about one-third of Canada's greenhouse gases or 244 of 734 Mt.¹

The province has the highest per-capita level of emissions in the country.

These undisputable facts present Albertans with a significant challenge as the world takes action on climate change. This challenge must be met with immediate and strategic action to start us down the path of reducing provincial emissions.

The reality is Alberta can not wait. We must take action now to transition to a low carbon future where energy resources are produced as cleanly as possible.

It won't be easy. The climate change issue is complex and affects all aspects of society. Jurisdictions around the world are wrestling with the same fundamental climate change question - how do we balance the needs of the environment while having a secure source of energy and a strong economy?

Driving this challenge is the world's growing need for energy. In fact, worldwide energy demand is expected to grow by 45 per cent from 2006 by 2030. And while renewable energy sources such as wind, solar and biomass continue to grow, the International Energy Agency projects that 80 per cent of total world demand in 2030 will still be met by fossil fuels.²

Alberta's reliance on coal-fired electricity and our role as a global energy supplier with the second-largest reserves of oil in the world have created a unique emissions profile for our province. Large industrial emitters account for about half of total provincial emissions.

This starting point will require a unique set of actions to ultimately reach the goal of making significant, long-term reductions here at the source. The key regulatory instrument for incenting reductions at large emitters in the province is the *Specified Gas Emitters Regulation* – a unique system in North America.

It requires large industry to make mandatory emission reductions, invest in alternative actions that reduce emissions elsewhere in the province, or put money towards innovative technology that will deliver reductions in the future.

2008 was the first full year of operations for the *Specified Gas Emitters Regulation*. This report details the results for 2008 and for the program to date. The results for the first compliance cycle, July 1st 2007 to December 31st 2007, are summarized in Appendix C.

¹ National Inventory Report 1990-2008, Environment Canada

² Reference Scenario, World Energy Outlook 2008, International Energy Agency

The Alberta Approach



Goals and Policies

The Government of Alberta is committed to reducing provincial greenhouse gas emissions. Alberta's plans are outlined in its 2008 climate change strategy. The strategy builds on what has already been done: implementing the first legislation of its kind in Canada to reduce greenhouse gas emissions, laying out the long-term roadmap to Alberta's 2020 and 2050 reduction objectives.

The strategy reflects Alberta's unique position as an energy supplier to the world and the reality that, for the foreseeable future, the world will continue to rely on Alberta's secure supply of oil and gas. The strategy also establishes practical, achievable goals for real reductions in greenhouse gas emissions. Instead of setting arbitrary targets, Alberta's approach breaks the problem down into manageable "wedges" for action with corresponding reductions in emissions set for each wedge. Alberta also recognizes that continuous changes and targeted actions will be required as we learn more, achieve positive results, and identify new opportunities and solutions.

Alberta's 2008 Climate Change Strategy commits to taking action on three themes: conserving and using energy efficiently; implementing carbon capture and storage; and greening energy production to transform the way we produce energy and to introduce cleaner, more sustainable approaches to energy production. The strategy also commits to quantitative results:

Year	Goal	Result
2010	Reduce projected emissions by 20 megatonnes	Meet intensity target established in 2002 plan
2020	Reduce projected emissions by 50 megatonnes	Stabilize greenhouse gas emissions and begin reductions
2050	Reduce projected emissions by 200 megatonnes	Emissions reduced by 50 percent below business as usual level and 14 percent below 2005 levels

Alberta's provincial Specified Gas Reporting Program and Specified Gas Emitters Regulation are complementary regulatory components which support the climate change strategy with a focus on the largest sources of emissions in Alberta.

Information gathered under the Specified Gas Reporting Regulation is needed to assist both the province and industry in characterizing emission sources and identifying opportunities for emission reductions. The program provides an annual inventory of greenhouse gas emissions from large industrial facilities in the province and provides a platform for smaller facilities to voluntarily report their greenhouse gas emissions. It also assists the government in monitoring the results of greenhouse gas reduction strategies.

The Specified Gas Emitters Regulation also requires facilities to report their emissions but goes further to require improvements in emissions performance.

In addition to these regulations Alberta has made some other significant commitments to reducing greenhouse gas emissions:

- \$2 billion commitment to carbon capture and storage – four projects being advanced (2 electricity, 2 oil sands related)
- Renewable Fuel Standard – mandates a 5 per cent blend of ethanol and 2 per cent biodiesel
- Bioenergy Strategy - \$239 Million program (leverage \$850 million in private funds)
- \$2 billion GreenTrip – commitment to public transit projects
- Incentives for energy efficiency – being run largely through Climate Change Central

More information on these initiatives is available on our website (www.environment.alberta.ca)

Specified Gas Reporting Regulation

The Alberta *Specified Gas Reporting Regulation* requires that all large Alberta industrial facilities emitting more than 100,000 tonnes of greenhouse gases in carbon dioxide equivalent (CO₂e) units per year—based on the sum of direct emissions of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆)—report their greenhouse gas emissions to Alberta Environment. Facilities that do not exceed the 100,000 tonne regulatory threshold may voluntarily report their emissions under the *Specified Gas Reporting Program*.

Specified Gas Emitters Regulation

The *Specified Gas Emitters Regulation* came into force on July 1, 2007 and is an important step in delivering on Alberta's 2008 *Climate Change Strategy*. The new requirement for large industry to reduce their emissions intensity by 12 per cent is mandated under a regulation in the *Climate Change and Emissions Management Act*.

The *Specified Gas Emitters Regulation* requires all facilities in Alberta emitting over 100,000 tonnes of carbon dioxide equivalent (CO₂e) per year to reduce their emissions intensity by 12 per cent below a baseline based on 2003-2005 emissions and production. New facilities, or those facilities that began operation on or after January 1, 2000 and that have completed less than eight years of commercial operation, are required to reduce their emissions intensity by two per cent per year starting in their fourth year of commercial operations. The reduction obligation for new facilities ramps up by two per cent per year until the ninth year of commercial operations when a 12 per cent target is reached. Facilities have several options to meet their emissions intensity reduction targets:

- Improve facility operations and efficiency.
- Pay \$15 per tonne of CO₂e into the Climate Change and Emissions Management Fund, which creates a pool of resources to enable additional projects or technology aimed at reducing greenhouse gas emissions in the province or aiding adaptation to climate change.
- Purchase emission offset credits generated from projects not subject to the *Specified Gas Emitters Regulation*. These credits must be from Alberta-based projects that occurred after January 1, 2002.
- Purchase emission performance credits from facilities that are subject to the *Specified Gas Emitters Regulation*. Some facilities may have reduced their emissions intensity beyond their target and may want to sell any extra reduction as a credit.

The regulation target puts a price on greenhouse gas emissions and uses market mechanisms such as emissions trading to ensure that the most cost effective reductions are pursued.

Facilities that exceed the 100,000 tonnes CO₂e threshold must satisfy the requirements of both the *Specified Gas Emitters Regulation* and the *Specified Gas Reporting Regulation*. In time, Alberta will move to harmonize the two regulations to ensure easier reporting for facilities. The data collected under the *Specified Gas Emitters Regulation* will be used to update the emissions reported in the *Specified Gas Reporting Regulation* as this data must be verified by a third party and should therefore be of higher accuracy.

July 1 to December 31, 2007 was the first half year of mandatory reductions. During this time, the emphasis was on getting the system up and running. Baseline performance was established, systems were tested for validating and auditing data, and stakeholders were informed about specific requirements.

All subsequent compliance periods are assessed on a full year, ending December 31. The second compliance cycle – and first full year – was 2008.

How Baselines are Set

For existing facilities that were operational before January 1, 2000, baseline emissions intensities are established using emissions and production data from 2003 to 2005.

New facilities are required to establish a baseline emissions intensity based on their third full year of commercial operation.

Annual Compliance

The *Specified Gas Emitters Regulation* has a March 31st compliance deadline. By March 31st each facility subject to the regulation must submit their annual report demonstrating how they have come into compliance with the reduction requirements. These reports must be verified by an independent third party.

Facilities must submit compliance units (actual reductions, Climate Change and Emissions Management Fund payments, offsets or emissions performance credits) which reduce their annual emissions intensity to their allowed intensity limit. This intensity limit is the facility baseline intensity less the facility's reduction target.

Climate Change and Emissions Management Fund

A unique aspect of Alberta's emissions regulatory system is the Climate Change and Emissions Management Fund. Companies required to meet the provincial reduction target can choose to pay \$15 a tonne of CO₂e into the fund for emissions over the reduction target.

The fund will then be invested into projects that support emission reduction technologies and improve our ability to adapt to climate change in Alberta.

During the first year and half under the Specified Gas Emitters Regulation approximately \$122 million was collected through the Climate Change and Emission Management Fund.

The fund is managed by the Climate Change and Emissions Management Corporation (CCEMC) (www.ccemc.ca). The CCEMC is an arm-length organization, independent from government, that is responsible for deciding how to allocate money collected in the fund.

In its first round of granting CCEMC has approved funding for 16 projects totaling \$71.4 million. These projects include three carbon capture and storage projects, five renewable energy projects, two projects focused on greening energy production and six energy efficiency projects.

A second round of projects focused on energy efficiency is under review at time of writing.

Carbon Offset Credits

Alberta has created the first regulated multi-sector carbon trading system in North America. The system encourages Alberta farmers, small energy producers, renewable electricity generators, transportation companies and municipalities, among others, to develop emission reduction projects that can create offset credits, which can be sold to facilities that need to meet their reduction obligations under the *Specified Gas Emitters Regulation*.

Alberta offset credits must be created using protocols approved by the province. These protocols are developed in partnership with stakeholders and based on national and international research. The protocols outline how to quantify and verify emission reductions for different types of projects. All credits used to meet the reduction targets must be verified by an independent, qualified third party before they are submitted to the province. Alberta also undertakes an annual audit of a sample of offset projects to improve the overall assurance of the system.

Credits are registered on the Alberta Offset Registry, which is operated by the province in partnership with Climate Change Central (carbonoffsetsolutions.climatechangecentral.com)

Emission Performance Credits

Emission performance credits (EPCs) are credits generated by facilities that have gone beyond their mandatory reduction target. EPCs can be banked for future use by the same facility in future compliance years or traded to other facilities that still need to meet the reduction target.

How We Got Here

2002

Alberta completes a comprehensive provincial climate change strategy outlining commitments to action including industrial regulation.

2003

Alberta signaled its commitment to manage greenhouse gas emissions by passing the *Climate Change and Emissions Management Act*. One of the first actions taken under the new legislation was to develop a mandatory reporting program for large emitters in Alberta.

2004

Large emitters in the province (over 100,000 tonnes of carbon dioxide equivalent a year) were required by law to submit an annual report on their previous year's greenhouse gas emissions.

2007

Alberta passed the *Specified Gas Emitters Regulation*, reinforcing its commitment to regulate greenhouse gas emissions from large emitters. The first compliance cycle was a half-year, from July 1 to December 31, 2007.

2008

Alberta released its climate change strategy, establishing goals for further reductions in greenhouse gas emissions. The strategy commits to taking action on three themes: conserving and using energy efficiently; implementing carbon capture and storage; and greening energy production. By 2050, Alberta will see a reduction of 200 million tonnes from business-as-usual projections.

2008

Alberta commits \$2 billion to carbon capture and storage. This funding will develop four large scale pilot projects that will provide valuable information on how to commercialize and deploy this clean energy technology in Alberta to make significant, long-term emission reductions.

2008 Specified Gas Emitters Regulation Results



The first full year of this program was a success. Large industrial emitters achieved real emission reductions and the province is continuing to work with stakeholders to learn about how the system operates and look for ways to make improvements along the way.

Detailed Report

Ninety-eight facilities fell under the *Specified Gas Emitters Regulation* for the 2008 compliance year, meaning they have previously emitted more than 100,000 tonnes of carbon dioxide equivalent (CO₂e) during a calendar year since 2003 and have completed three years of commercial operation.

These facilities emitted a total of 107.4 million tonnes of CO₂e. This represents 44 per cent of Alberta's total emissions for 2008. Of these emissions 5.7 million tonnes were classified industrial process emissions, 4.9 million tonnes were CO₂ emissions from biomass and 4.6 million tonnes resulted from co-generating electricity and heat rather than simply producing heat. These emissions do not receive a reduction target and are not included in the facility baseline intensity. The remaining total of 92.1 million tonnes of CO₂e were under a reduction target.

- Industrial process emissions result from fixed chemical reactions, other than combustion where the primary purpose is not energy generation.
- CO₂ emissions from biomass are considered to be neutral as long as the biomass source is under sustainable management.
- Additional emissions from cogeneration of electricity rather than simply producing heat are not placed under a target to prevent any disincentive to cogeneration.

Business as usual emissions from the period are calculated by assuming that the production in the compliance period would have occurred at the historic intensity. This level of emissions is used as a reference against which reductions are required. Business as usual emissions for the period would have been 93.3 million tonnes. Actual emissions were 92.1 million tonnes reflecting a reduction at facilities versus business as usual.

For the 2008 compliance cycle of the *Specified Gas Emitters Regulation*, large final emitters owed 7.0 million tonnes of additional compliance once improvements at the facilities and recognition of cogeneration were taken into account. Results indicate that 606 thousand tonnes worth of operational improvements were submitted as part of compliance in the form of EPCs. A further 3.0 million tonnes of Alberta-based offsets were purchased and submitted, and \$78 million was paid to the Climate Change and Emissions Management Fund (equalling 5.2 million tonnes worth of compliance). Figure 1 summarizes these results.

2008 Compliance (12.6 M tonnes total)

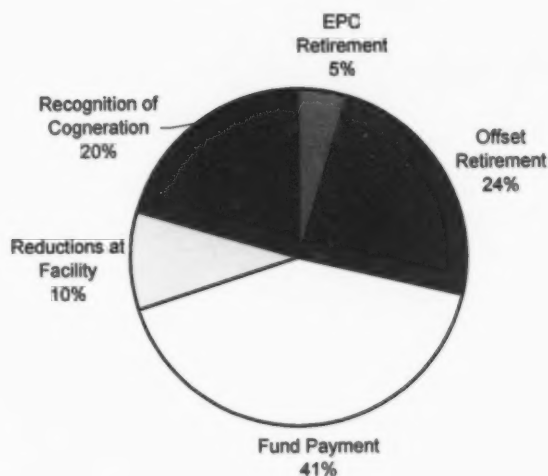


Figure 1: 2008 Compliance by Type

Reductions at Facility, Cogeneration and Emission Performance Credits

Facilities made emissions reductions on site versus their baseline performance. Reductions on site which go beyond the required reduction target generate EPCs. A facility's obligation to true up through offset retirement, EPC retirement or Climate Change and Emissions Management Fund purchases may also be reduced or EPCs may be generated through the recognition of cogeneration of heat and electricity.

Reductions on site (1.2 million tonnes) and recognition of cogeneration (2.6 million tonnes) including EPC generation totaled 3.8 million tonnes CO₂e.

For the purpose of reporting on reductions under this program, reductions are counted in the year they occur, even if EPCs are generated (e.g. all EPCs generated for on site reductions in 2008 are counted towards reporting reductions in 2008, even though only a fraction were used for compliance). They are not counted as reductions in subsequent years as they are submitted; however retired EPCs are counted when reporting on compliance action taken by facilities.

In 2008, 1.8 million tonnes of EPCs were generated at 25 facilities. Only 11 facilities submitted a total of 606 thousand tonnes of EPCs for compliance, the remainder was banked for use in future compliance years.

Carbon Offset Credits

Alberta has created the first regulated carbon trading system in North America. The system encourages Alberta farmers, small energy producers, renewable electricity generators, transportation

companies and municipalities among others to develop emission reduction projects that can create offset credits, which can be sold to large final emitters unable to make immediate reductions on site.

The 2008 compliance year saw 28 facilities submit 3.0 million tonnes CO₂e of offset credits from 27 projects across Alberta.

The majority of offsets came from the reduced tillage and wind power categories.

Project Type	2008 compliance tonnes from offsets
Energy Efficiency	22,000
Landfill Gas Capture	39,000
Waste Diversion to Compost	144,000
CO ₂ Capture in Enhanced Oil Recovery	209,000
Biomass Power	277,000
Acid Gas Injection	293,000
Small Scale Hydro	428,000
Wind Power	592,000
Reduced Tillage Agriculture	1,008,000
TOTAL	3,012,000

Rounded to the nearest 1,000 tonne.

2008 Offset Retirement by Project Type (3.0M tonnes total)

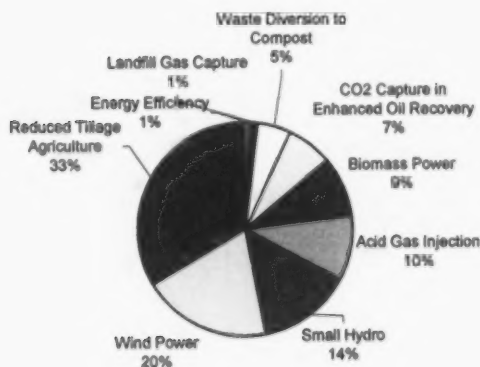


Figure 2: 2008 Offset Retirement by Project Type

Results by Sector

2008 compliance outcomes for the facilities are summarized by industry sector below.

Sector	# of Facilities	Emissions ^a	Tonnes Owed	EPC generated	EPC submitted	Pems Units purchased	Total Pems Contribution	Offset used
Chemical Manufacturing	9	5,430,000	204,000	165,000	10,200	39,400	591,000	155,000
Coal Mining	3	497,000	67,700	4,800	-	67,000	1,005,000	965
Fertilizer Manufacturing	5	2,110,000	268,000	-	34,100	233,000	3,495,000	-
Forest Products	4	471,000	-	476,000	-	-	-	-
Gas Plants	32	6,870,000	1,041,000	137,000	294	864,000	12,960,000	177,000
Minerals Processing	4	949,000*	102,000	-	-	56,800	852,000	46,000
Oil Sands In Situ Extraction	8	10,200,000	704,000	178,000	42,000	607,000	9,105,000	54,900
Oil Sands Mining and Upgrading	4	17,700,000	963,000	-	364,000	444,000	6,660,000	154,000
Petroleum Refineries	3	2,320,000*	401,000	-	30,400	139,000	2,085,000	232,000
Pipeline Transportation	4	2,851,000	375,000	-	-	374,000	5,610,000	-
Power Plants	21	46,400,000	4,630,000	842,000	124,000	2,310,000	34,600,000	2,190,000
Waste Management	1	127,600	18,229	-	-	18,157	272,355	-
TOTAL	98	95,926,000*	8,769,000	1,803,000	606,000	5,231,000	78,465,000	3,013,000

Entries rounded to three decimal places, totals rounded to nearest 1,000 tonne.

* Excludes facilities whose emissions are deemed confidential.

^a Excludes Industrial Process and CO₂ from biomass.

Reporting Actual Emission Reductions

Results show that Alberta has achieved 4.2 million tonnes of emissions reductions in 2008 versus business as usual through reductions on site and offset retirement.

The tables below break down the results for the 2008 compliance period. (All values are rounded.)

Emissions	
Total emissions from regulated facilities	107.0 Mt
- Industrial process emissions	5.7 Mt
- Biomass CO ₂ emissions	4.9 Mt
- Cogeneration electricity emissions	4.6 Mt
= Emissions subject to reduction target	92.1 Mt

Required reductions are the difference between the projected baseline intensities and the allowed emissions levels for the facility. This is slightly less than 12 per cent of total emissions subject to reduction target due to new facilities which are still in the ramp up phase of their reduction targets.

Required Reductions	
Business as usual emissions at baseline intensity	93.3 Mt
Required Reductions	10.7 Mt

Compliance with allowed emissions intensity levels can come through a number of forms including intensity reductions at the facility, operation of efficient cogeneration plants, retirement of purchased offset credits, retirement of emissions performance credits or payment into the Climate Change and Emissions Management Fund.

Compliance	
Emissions savings at facility	1.2 Mt
Recognition of cogeneration	2.6 Mt
Offset credit retirement	3.0 Mt
EPC retirement	0.61 Mt
Climate Change and Emissions Management Fund (CCEMF) units purchased	5.2 Mt
Total Compliance	12.6 Mt

Each facility must meet its emissions reduction target. When total compliance is greater than the reduction requirement it is because some facilities have gone beyond their required reduction and have generated bankable, tradable emissions performance credits.

Emissions Performance Credits Generated	
Total compliance	12.6 Mt
Less required reductions	10.7 Mt
EPCs generated	1.8 Mt

Program Results to Date

The following tables summarize the results of the program to date including both the 2007 half year compliance period and the 2008 full year compliance period.

Emissions	2007 half year	2008 full year	Totals
Total emissions from regulated facilities	56.5 Mt	107.4 Mt	163.8 Mt
- Industrial process emissions	3.0 Mt	5.7 Mt	8.7 Mt
- Biomass CO ₂ emissions	2.6 Mt	4.9 Mt	7.5 Mt
- Cogeneration electricity emissions	2.5 Mt	4.6 Mt	7.1 Mt
= Emissions subject to reduction target	48.4 Mt	92.1 Mt	140.5 Mt

Emissions at Facilities Subject to Specified Gas Emitters Regulation

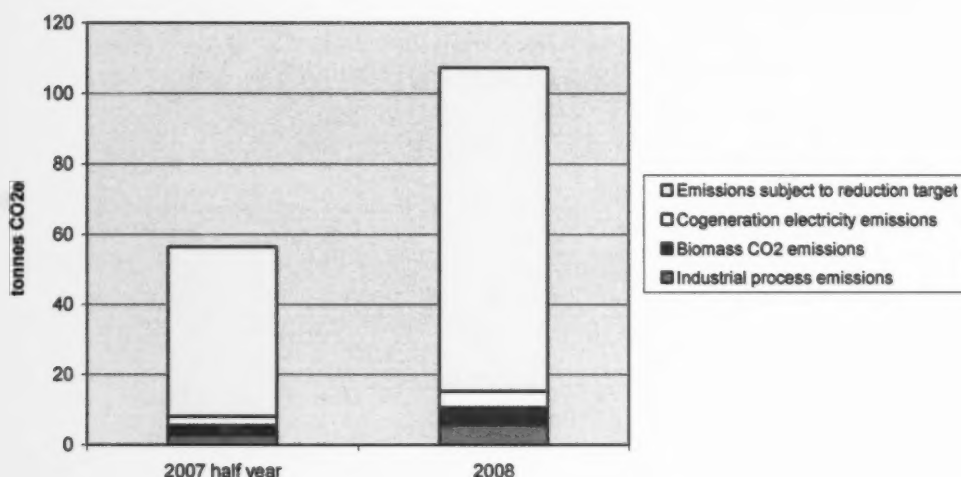


Figure 3: Emissions and Target Exemptions

Required Reductions	2007 half year	2008 full year	Totals
Business as usual emissions at baseline intensity	49.1 Mt	93.3 Mt	142.4 Mt
Required Reductions	5.6 Mt	10.7 Mt	16.3 Mt

Compliance	2007 half year	2008 full year	Totals
Emissions savings at facility	0.6 Mt	1.2 Mt	1.8 Mt
Recognition of cogeneration	2.2 Mt	2.6 Mt	4.7 Mt
Offset credit retirement	0.9 Mt	3.0 Mt	3.9 Mt
EPC retirement	0.15 Mt	0.61 Mt	0.76 Mt
CCEMF units purchased	2.9 Mt	5.2 Mt	8.2 Mt
Total Compliance	6.8 Mt	12.6 Mt	19.4 Mt

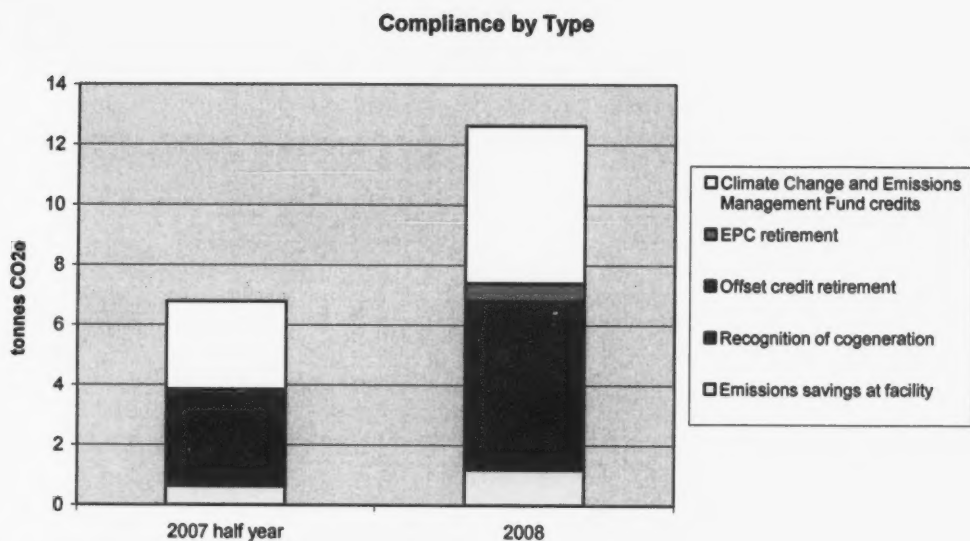


Figure 4: Compliance by Type

Emissions Performance Credits Generated	2007 half year	2008 full year	Totals
Total compliance	6.8 Mt	12.6 Mt	19.4 Mt
Less required reductions	5.6 Mt	10.7 Mt	16.3 Mt
EPCs generated	1.0 Mt	1.8 Mt	2.8 Mt

Looking Ahead



Learn from our experience. Take the next step forward. Be a global citizen.

Through the *Specified Gas Emitters Regulation*, Alberta has put the foundational pieces in place for a prudent emission regulatory regime in the province:

- Mandatory reduction targets for large emitters
- Price on carbon
- Regulated carbon offset credit market
- Dedicated, annual funding for emissions reduction projects

While Alberta is taking significant action, these are only our first steps. We realize that more needs to be done.

We'll continue to refine our system so that it drives innovation and emission reductions at the source in ways that make sense given our emissions profile and best opportunities for success.

As an energy exporter and the largest provincial emitter in Canada, what happens outside the Alberta border could be seen as just as important as the actions we take within our province. We will continue to work closely with the federal government on a cohesive national climate change policy. We will monitor international climate change negotiations and be a part of the conversation where possible.

How the world moves forward on climate change will play a crucial role in helping to inform exactly what the future direction of Alberta's regulations will be. Our priority is to ensure our industry remains competitive and to invest in emission reduction solutions here at home.

Alberta's contribution to global efforts rests with our belief that clean energy technology is key to global emission reductions. We are investing heavily in clean energy technology, through money generated by the *Specified Gas Emitters Regulation* and other commitments such as \$2 billion for carbon capture and storage.

While this report focuses on the *Specified Gas Emitters Regulation* and large industrial emissions sources the Government of Alberta continues to develop initiatives that support the climate change strategy across all levels of activity within Alberta.

Climate change is one of the biggest public policy challenges of our time. We need to change the way we think about and use energy and other emission intensive goods and services. Albertans will need to alter consumption patterns, and consider our responsibilities in a global context.

Overcoming that challenge will require something from all of us.

Appendix A: Alberta's emissions profile



Large industrial facilities emitting more than 100,000 tonnes of greenhouse gases a year which are captured under the *Specified Gas Emitters Regulation* are responsible for about 44 per cent of Alberta's overall emissions or 107.4 Mt. The emissions of these large final emitters in Alberta are shown below by sector.

2008 Regulated Emissions by Sector (107.4 Mt total)

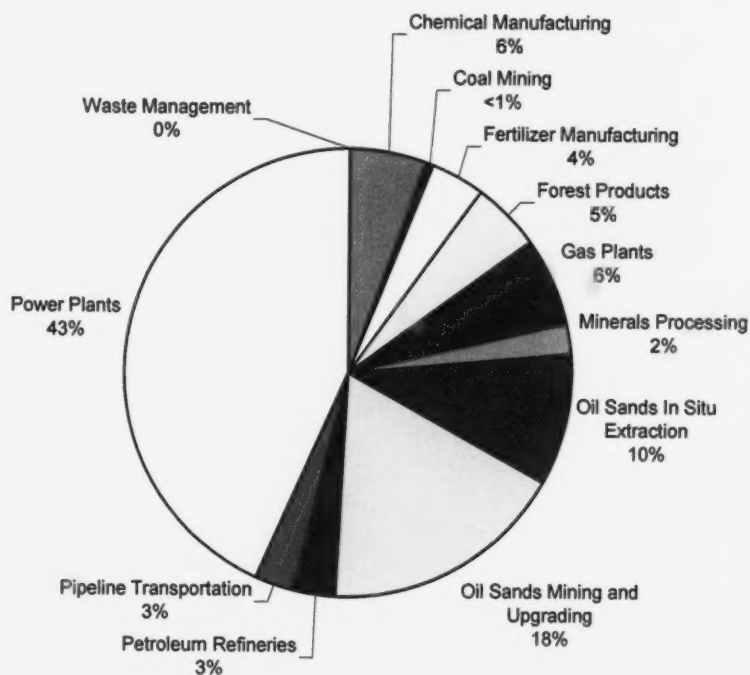


Figure 5: Alberta Greenhouse Gas Emissions by Sector

Appendix B: Individual Facility Results to Date



The following tables summarize individual facility performance for the 2007 half year compliance period and the 2008 full year compliance period.

Baseline intensity is the assigned baseline intensity for the facility in that period. From time to time baselines require updating. In these cases the baseline for different compliance periods may be different.

Intensity is the calculated intensity for the compliance period and includes recognition of cogeneration where applicable.

Emissions are total annual emissions in tonnes of CO₂e. This excludes industrial process emissions and CO₂ emissions from biomass. Total annual emissions may differ from values reported under the *Specified Gas Reporting Regulation* due to differences in facility definitions used under the two systems and due to the exclusion of industrial process emissions and CO₂ emissions from biomass.

True up refers to the tonnes of CO₂e that had to be submitted for compliance in the form of Climate Change and Emissions Management Fund credits, offset credits or retired emissions performance credits. A negative value indicates emissions performance credits were generated.

* Denotes facility with cogeneration.

■ Denotes a compliance period for which the reported values are from an unreviewed re-submission. These entries will be updated as necessary with the next reporting period.

Chemical Manufacturing

Reporting Company Name	Facility	2007 Half Year				2006				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Air Liquide Canada Inc	Scottford Complex	0.07242	0.04343	218,144	-52,203*	0.07242	0.04472	426,450	-86,665*	tCO ₂ e/GJ
Alberta Envirofuels Inc.	Edmonton	0.7143	0.6071	161,365	-5,713	0.7143	0.6643	281,060	15,099	tCO ₂ e/tonne
Cancarb	Medicine Hat	0.9294	1.813	55,308	0	3.2602	3.048	120,000	7,056	tCO ₂ e/tonne
Dow Chemical Canada ULC	Dow Chemical Canada ULC - Western Canada Operations	1.0356	0.8740	668,379	-26,047*	1.0356	0.8633	1,309,100	-63,308*	tCO ₂ e/tonne
INEOS Canada Partnership	Joffre LAO Plant	0.5767	0.4237	58,482	-16,352	0.5767	0.4621	103,800	-15,394	tCO ₂ e/tonne
MEGlobal Canada Inc	Prentiss Manufacturing Facility	0.1508	0.1145	88,414	-14,021	0.1508	0.1360	183,790	4,512	tCO ₂ e/tonne
Nova Chemical Corporation	Joffre	0.5578	0.4779	1,393,545	0*	0.5578	0.5300	2,644,400	147,714*	tCO ₂ e/tonne
Rio Tinto Alcan Inc	Strathcona Works	0.4869	0.4850	43,394	5,058	0.4869	0.5026	96,642	14,250	tCO ₂ e/tonne
Shell Chemicals Canada Ltd.	Shell Chemicals Scottford	0.3223	0.2904	141,647	3,286	0.3223	0.3017	262,650	15,719	tCO ₂ e/tonne

Coal Mining

Reporting Company Name	Facility	2007 Half Year				2006				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Coal Valley Resources Inc	Coal Valley Mine	0.0551	0.04637	76,047	-3,473	0.0551	0.04718	173,370	-4,797	tCO ₂ e/tonne metallurgical clean coal
Teck Coal Limited	Cardinal River Coals Limited	N/A	N/A	N/A	N/A	0.05932	0.06110	103,390	5,022	tCO ₂ e/tonne
TransAlta Utilities Corporation	Highvale Coal Mine	0.0145	0.01658	107,161	24,697	0.0145	0.01783	220,290	62,678	tCO ₂ e/tonne of uncovered coal

Fertilizer Manufacturing

Reporting Company Name	Facility	2007 Half Year				2008				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Agrium Inc.	Agrium Carseland Nitrogen Operations	0.5419	0.4798	199,645	1,220	0.5344	0.4808	402,740	8,789	tCO ₂ e/tonne
Agrium Inc.	Agrium Fort Sault Ste. Marie Nitrogen Operations	0.6025	0.5270	176,704	0	0.6025	0.609	291,980	37,760	tCO ₂ e/tonne
Agrium Inc.	Agrium Redwater Fertilizer Operations	0.2483	0.2452	181,027	19,722	0.2483	0.2734	548,160	110,111	tCO ₂ e/tonne
Canadian Fertilizers Limited	CFL Medicine Hat	0.5138	0.5138	390,214	46,838	0.4914	0.4954	870,810	110,737	tCO ₂ e/tonne
Orica Canada Inc	Orica Carseland Works	0.0011	0.0009572	214	-2	0.0011	0.001281	596	146	tCO ₂ e/tonne

Forest Products

Reporting Company Name	Facility	2007 Half Year				2008				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Alberta-Pacific Forest Industries	Boyle	0.1515	-0.1798	47,680	-105,132*	0.1515	-0.1575	111,860	-175,261*	tCO ₂ e/ADMT
Dalshouse International Ltd	Peace River Pulp Division	0.1704	-0.1275	39,431	-68,732*	0.1704	-0.04915	110,050	-89,266*	tCO ₂ e/ADMT
West Fraser Mills Limited	Hinton Pulp	0.3356	0.1242	76,268	-27,879*	0.3356	0.1268	148,330	-54,800*	tCO ₂ e/ADMT
Weyerhaeuser Company Limited	Weyerhaeuser Grande Prairie Operations	0.2970	-0.1646	54,356	-81,682*	0.297	-0.1757	101,110	-156,635*	tCO ₂ e/tonne

Gas Plants

Reporting Company Name	Facility	2007 Half Year				2006				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Apache Canada Ltd	Zama Gas processing Plant	0.1537	0.1965	46,186	14,395	0.1537	0.1910	86,779	25,320	tCO2e/m3OE
Blaze Energy	Blaze Brazeau Gas Plant	0.1740	0.2957	48,414	23,348	0.3194	0.3302	136,483	20,301	tCO2e/e3m3
Bonavista Petroleum Ltd.	Carstairs-Crossfield	0.4985	0.4668	67,965	4,092	0.4985	0.5804	103,330	25,233	tCO2e/e3m3
BP Canada	BP Fort Saskatchewan	0.0280	0.02778	38,100	4,337	0.028	0.02951	89,891	11,612	tCO2e/m3OE
Canadian Natural Resources Limited	Hays Gas plant	0.4363	0.3727	28,199	-852	0.4363	0.4558	62,612	9,720	tCO2e/m3OE
ConocoPhillips Canada	Elmworth Sweet Gas Plant	0.0486	0.04969	103,581	14,420	0.0573	0.05730	242,840	29,126	tCO2e/m3OE
Devon Canada Corporation	Wapiti Gas Plant	0.0325	0.03482	59,650	10,652	0.0325	0.03550	120,150	23,359	tCO2e/m3OE
EnCana Oil & Gas Co. Ltd	Caribou North Compressor Station	0.1024	0.1480	41,811	16,355	0.148	0.1480	64,383	7,749	tCO2e/E3m3
Husky Oil Operations	Ram River Gas plant & Sulphur Handling	0.1869	0.1643	358,574	-323	0.1869	0.1674	662,620	11,529	tCO2e/E3m3
Imperial Oil Resources	Bonnie Glen Gas Plant	94.6759	149.1	111,199	49,059	94.6759	163.8	38,045	18,698	tCO2e/km3 OE
Imperial Oil Resources	Quirk Creek Gas Plant	0.1907	0.4413	40,043	24,816	0.1907	0.3285	92,793	45,396	tCO2e/km3
Inter Pipeline Extraction Ltd	Cochrane Extraction Plant	0.0242	0.01980	210,543	-15,868	0.02420	0.01961	360,120	-31,076	tCO2e/m3
Keyera Energy Ltd.	Brazeau Gas Plant	0.1111	0.1187	48,945	8,640	0.1111	0.09868	89,410	821	tCO2e/1000 m3
Keyera Energy Ltd.	Nevis Gas Plant	0.1550	0.1317	59,007	-2,132	0.155	0.1468	115,250	8,135	tCO2e/m3OE
Keyera Energy Ltd.	Rimbey Gas plant	0.0993	0.08863	124,849	1,701	0.0993	0.09218	241,890	12,605	tCO2e/1000 m3
Keyera Energy Ltd.	Strachan Gas Plant	0.1777	0.1546	137,363	-1,589	0.1777	0.1566	275,230	294	tCO2e/1000 m3
Nexen Inc.	Balzac Gas Processing Plant	0.3397	0.5200	92,432	39,291	0.3397	0.4575	227,940	79,010	tCO2e/E3 m3
Pengrowth Energy Trust	Judy Creek Gas Conservation Plant (JCGCP)	0.1642	0.09189	37,128	-21,385	0.1642	0.1050	71,886	-27,047	tCO2e/m3OE
Pengrowth Energy Trust	Olds sour Gas plant	0.2988	0.3004	59,777	7,457	0.2988	0.2914	112,970	11,057	tCO2e/m3OE
Petro-Canada	Hanlan Robb Gas Plant	0.1645	0.1859	225,610	49,891	0.1645	0.1912	406,300	99,036	tCO2e/e3m3
Petro-Canada	Wildcat Hills Gas Plant	0.1586	0.1737	67,229	13,201	0.1586	0.1826	132,240	31,115	tCO2e/e3m3

PrimeWest Energy Inc.	Crossfield Gas Plant	0.0869	0.08053	64,457	3,248	0.0869	0.07359	143,240	-5,601	tCO ₂ e/m ³ OE
SemCAMS ULC	K3 Gas Plant	0.1345	0.1969	204,508	81,566	0.1345	0.1994	468,370	190,260	tCO ₂ e/m ³ OE
SemCAMS ULC	KA Gas Plant	0.1307	0.1216	117,412	6,352	0.1307	0.1222	238,140	14,028	tCO ₂ e/m ³ OE
SemCAMS ULC	West Whitecourt Sour Gas Plant	0.1477	0.1355	94,300	3,861	0.1477	0.1391	167,590	11,005	tCO ₂ e/m ³ OE
Shell Canada Limited	Burnt Timber	0.1771	0.1978	85,456	18,123	0.1771	0.2182	177,690	48,086	tCO ₂ e/e ₃ m ³
Shell Canada Limited	Caroline Complex	0.2265	0.2361	268,129	43,684	0.2265	0.2566	545,550	120,224	tCO ₂ e/e ₃ m ³
Shell Canada Limited	Jumping Pound	0.1738	0.1746	140,076	17,363	0.1738	0.1770	276,760	37,656	tCO ₂ e/e ₃ m ³
Shell Canada Limited	Waterton Complex	0.2867	0.3353	253,194	62,884	0.2867	0.4526	295,760	117,620	tCO ₂ e/e ₃ m ³
Spectra Energy Empress LP	Empress Straddle Plant	0.2139	0.2075	186,470	17,279	0.2139	0.208	379,830	36,196	tCO ₂ e/m ³ Oil Equivalent
Talisman Energy Inc.	Edson Gas Plant	0.1390	0.09971	117,841	-23,081*	0.1365	0.1017	242,050	-37,683*	tCO ₂ e/m ³ OE
Taylor Processing Inc.	Hermattan Sour Gas Plant	0.1552	0.1552	117,636	-23,290	0.2113	0.1637	264,160	-35,734	tCO ₂ e/m ³ OE

Minerals Processing

Reporting Company Name	Facility	2007 Half Year				2008				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Graymont Western Canada Inc.	Graymont Exshaw	0.6257	0.5946	confidential	2,494	0.6257	0.6678	confidential	13,106	tCO ₂ e/tonne
Lafarge Canada Inc.	Lafarge Exshaw Plant	0.3023	0.2966	209,605	21,634	0.3023	0.2995	406,850	45,462	tCO ₂ e/tonne
Lehigh Inland Cement Limited	Lehigh Inland Cement	0.3037	0.2780	172,923	6,655	0.3226	0.3058	326,170	23,517	tCO ₂ e/tonne
Sherritt International Corporation	Fort Saskatchewan	6.1324	5.563	100,658	3,004	6.1324	5.961	213,630	20,202	tCO ₂ e/tonne

Oil Sands In Situ Extraction

Reporting Company Name	Facility	2007 Half Year				2008				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Canadian Natural Resources Limited	Primrose North Thermal Operation	0.5976	0.5727	1,284,658	93,180*	0.7422	0.6972	976,970	61,781	tCO2e/m3 bitumen
Canadian Natural Resources Limited	Wolf Lake and Primrose South Thermal Operation	N/A	N/A	N/A	N/A	0.5744	0.6241	1,576,000	257,286*	tCO2e/m3 bitumen
FCCL Oil Sands Partnership - EnCana corporation	Christina Lake SAGD Bitumen Battery	0.3680	0.3540	52,441	107	0.368	0.335	126,060	-4,068	tCO2e/m3 bitumen
FCCL Oil Sands Partnership - EnCana corporation	Foster Creek SAGD Bitumen Battery	0.3409	0.2906	568,771	-45,359*	0.3409	0.2982	1,158,000	-47,208*	tCO2e/m3 bitumen
Imperial Oil Resources	Cold Lake	0.4973	0.4319	2,300,821	-26,785*	0.4973	0.4699	4,532,600	275,619*	tCO2e/m3 bitumen
Japan Canada Oilsands Limited	Hangingstone SAGD Demo. facility	0.5089	0.5304	114,282	15,597	0.5089	0.5632	234,710	48,094	tCO2e/m3 bitumen
Petro-Canada	MacKay River In situ Oil Sands	0.2062	0.1545	82,886	-21,120	0.1173	0.115	199,470	6,877	tCO2e/m3 bitumen
Shell Canada Limited	Peace River Complex	0.6582	0.6763	202,046	28,992	0.6582	0.6651	352,720	54,507	tCO2e/m3 bitumen
Sunoco Energy Inc. Oil Sands	Firebag In situ	0.4653	0.4307	606,735	-28,074*	0.4653	0.3866	1,106,600	-126,424*	tCO2e/m3 bitumen

Oil Sands Mining and Upgrading

Reporting Company Name	Facility	2007 Half Year				2008				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Albian Sands	Muskeg River Mine	0.0479	0.06474	238,657	65,623	0.0479	0.07714	566,910	228,994	tCO2e/m3 bitumen
Shell Canada Ltd.	Scotford Upgrader and Upgrader Cogen.	0.0810	0.09333	547,524	50,571*	0.081	0.1046	1,137,200	203,607*	tCO2e/m3 OE
Suncor Energy Inc. Oil Sands	Suncor Base	0.4749	0.4472	3,211,698	210,114	0.4749	0.4484	6,032,700	410,273	tCO2e/m3 SCO
Synchrude Canada Ltd	Mildred Lake and Aurora North Plant Sites	580.5	498.6	5,416,526	57,812*	580.5	517.8	9,974,800	119,719*	tCO2e/m3 SSB

Petroleum Refineries

Reporting Company Name	Facility	2007 Half Year				2008				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Imperial Oil	Strathcona Refinery	1.2484	1.184	804,421	58,110	1.2484	1.218	1,417,200	138,623	CO2e/RAI
Petro-Canada	Petro-Canada Edmonton Refinery	0.0030	0.003313	755,945	153,539	0.0030	0.003434	901,500	208,474	CO2e/RAI bbl
Shell Canada Products	Shell Scotford Refinery	0.6231	0.6542	352,856	23,482	0.6231	0.6472	confidential	53,650	CO2e/RAI

Pipeline Transportation

Reporting Company Name	Facility	2007 Half Year				2008				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Alliance Pipeline Ltd.	Alberta Pipeline System for Alliance Pipeline Ltd.	31.7800	33.80	282,778	38,199	31.78	32.86	568,450	73,443	tCO ₂ e/E6m3 Natural Gas
ATCO Gas and Pipelines Ltd.	ATCO Pipelines	0.3162	0.2923	60,062	2,893	0.3162	0.2854	106,880	2,657	tCO ₂ e/TJ
Foothills Pipelines Ltd.	Foothills Pipeline System, AB	0.0395	0.0408	155,217	23,043	0.0395	0.04271	272,460	50,726	tCO ₂ e/E6m3 x km
NOVA gas Transmissions Ltd.	TransCanada, AB System	0.0368	0.0419	1,131,967	257,542	0.0368	0.03724	1,805,900	248,659	tCO ₂ e/E6m3 x km

Power Plants

Reporting Company Name	Facility	2007 Half Year				2008				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Alberta Power (2000) Ltd.	Battle River Generating Station	1.0554	1.035	2,530,088	259,556	1.0554	1.038	5,074,915	533,254	tCO ₂ e/MWh
Alberta Power (2000) Ltd.	Rainbow Lake Unit 1-3	0.9268	1.116	9,231	2,486	0.9268	1.093	29,561	7,504	tCO ₂ e/MWh
Alberta Power (2000) Ltd.	Sheerness Generating Station	1.0238	1.000	2,956,190	293,242	1.0238	1.025	6,024,752	727,688	tCO ₂ e/MWh
Atco Power Alberta Limited Partnership	Rainbow Lake Unit 4	0.0634	0.03529	81,561	-7,477*	0.0634	0.03073	146,085	-15,627*	tCO ₂ e/GJ
Cogeneration heat host Husky Oil, Rainbow Lake Processing Plant										
Atco Power Alberta Limited Partnership	Rainbow Lake Unit 5	0.5441	0.5753	51,587	5,722	0.5441	0.5445	97,801	7,873	tCO ₂ e/MWh
Atco Power Canada Ltd.	Muskeg River Cogeneration Station	0.0634	0.04079	554,180	-136,416*	0.0634	0.04214	1,141,413	-250,220*	tCO ₂ e/GJ
Cogeneration heat host Albian Sands, Muskeg River Mine										

Calgary Energy Centre NO.2, Inc.	Calgary Energy Centre	0.3674	0.4046	108,851	11,992	0.3674	0.4073	275,010	36,846	tCO2e/MWh
City of Medicine Hat Electric Utility - Generation	CM Medicine Hat	0.4645	0.4524	167,010	16,106	0.4758	0.4533	350,680	26,764	tCO2e/MWh
EnCana Corporation	Cavalier Power Plant	0.4789	0.4575	99,677	1,591	0.4789	0.4527	159,000	4,248	tCO2e/MWh
EPCOR Power Generation Services Inc	Genesee Thermal Generating station Units 1 and 2	1.0388	0.9925	3,126,705	246,723	1.0388	0.9669	5,727,100	312,886	tCO2e/MWh
Milner Power Inc	H.R. Milner Generating Station	1.2554	1.099	554,268	-3,131	1.2554	1.052	756,680	-38,412	tCO2e/MWh
Nexen Inc.	Batzac Power Plant	0.4654	0.4391	66,665	1,713	0.4654	0.4464	182,950	11,281	tCO2e/MWh
Suncor Energy Inc. Oil Sands	Transalta Poplar Creek Power Station	0.0626	0.03667	630,803	-97,206*	0.0626	0.03803	1,272,200	-196,156*	tCO2e/GJ
Cogeneration heat host Suncor Energy Inc., Suncor Base										
TransAlta Cogeneration LP	Fort Saskatchewan Thermal Electric Co-Gen Power	0.0570	0.03667	175,258	-3,714*	0.057	0.03854	345,580	-5,724*	tCO2e/GJ
Cogeneration heat host Dow Chemicals, Dow Chemical Canada ULC - Western Canada Operations										
TransAlta Utilities Corporation	Kepphills Thermal Electric Power	1.0411	1.059	3,300,830	444,406	1.0411	1.075	6,131,900	904,796	tCO2e/MWh
TransAlta Utilities Corporation	Sundance Thermal Electric Power	1.0476	1.051	7,339,599	698,618	1.0476	1.057	14,888,000	1,904,662	tCO2e/MWh
TransAlta Utilities Corporation	Wabamun Thermal Electric Power	1.2356	1.146	1,144,669	58,269	1.2356	1.157	2,433,300	147,339	tCO2e/MWh
TransCanada Energy Ltd.	Bear Creek Co-generation Power Plant	0.0638	-0.01327	33,167	-6,658*	0.0638	-0.002134	79,121	-15,132*	tCO2e/GJ
Cogeneration heat host Weyerhaeuser Company Limited, Grande Prairie Operations										
TransCanada Energy Ltd.	Carseland cogeneration Power Plant	0.0638	0.03639	166,314	-34,058*	0.0638	0.03230	310,740	-75,013*	tCO2e/GJ
Cogeneration heat host Agrium, Carseland Nitrogen Operations										
TransCanada Energy Ltd.	MacKay River Cogen Power Plant	0.0638	0.03876	290,237	-58,501*	0.0638	0.03253	786,860	-213,220*	tCO2e/GJ

Cogeneration heat host Petro-Canada, MacKay River Insitu Oil Sands										
TransCanada Energy Ltd.	Redwater Cogeneration Power Plant	0.0638	0.03627	86,609	-19,035*	0.0638	0.03943	175,630	-30,483*	tCO ₂ e/GJ
Cogeneration heat host Agrium Inc., Redwater Fertilizer Operations										

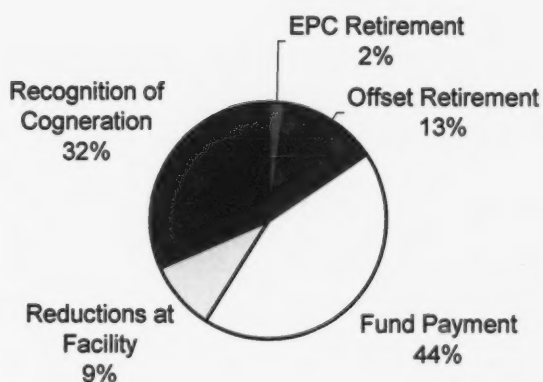
Waste Management

Reporting Company Name	Facility	2007 Half Year				2008				Intensity Units
		Baseline Intensity	Intensity	Emissions	True Up	Baseline Intensity	Intensity	Emissions	True Up	
Waste Management	West Edmonton Landfill	17.15	16.20	63,393	4,322	17.15	17.61	127,600	18,229	tCO ₂ e/tCH ₄

Appendix C: 2007 Half Year Summary



2007 Compliance (6.8M tonnes total)



Emissions	2007 half year
Total emissions from regulated facilities under program	56.5 Mt
- Industrial Process Emissions	3.0 Mt
- Biomass CO ₂ emissions	2.6 Mt
- Cogeneration Electricity Emissions	2.5 Mt
= Emissions Under Target	48.4 Mt

Required Reductions	2007 half year
Business as usual emissions	49.1 Mt
Required Reductions	5.6 Mt

Compliance	2007 half year
Emissions savings at facility	0.6 Mt
Recognition of Cogeneration	2.2 Mt
Offset Credit Retirement	0.9 Mt
EPC retirement	0.15 Mt
Climate Change and Emissions Management Fund Credits	2.9 Mt
Total Compliance	6.8 Mt

Emissions Performance Credits Generated	2007 half year
Total Compliance	6.8 Mt
Less Required Reductions	5.6 Mt
EPCs generated	1.0 Mt

Sector	# of Facilities	Emissions*	Tonnes Offset	EPC generated	EPC submitted	Trade Units purchased	Total Emissions Contribution	Offset used
		Tonnes CO ₂ e	Tonnes CO ₂ e	Tonnes CO ₂ e	Tonnes CO ₂ e	Units	Tonnes CO ₂ e	Tonnes CO ₂ e
Chemical Manufacturing	9	2,830,000	8,340	114,000	-	8,340	125,000	-
Coal Mining	2	183,000	24,700	3,470	-	24,700	370,000	-
Fertilizer Manufacturing	5	948,000	67,800	2	-	67,800	1,020,000	-
Forest Products	4	218,000	-	283,000	-	-	-	-
Gas Plants	32	3,660,000	536,000	88,500	28,900	507,000	7,600,000	-
Minerals Processing	4	483,000*	33,800	-	-	33,800	507,000	-
Oil Sands In Situ Extraction	8	5,210,000	138,000	121,000	850	137,000	2,050,000	-
Oil Sands Mining and Upgrading	4	10,300,000	384,120	-	94,200	269,000	4,035,000	20,900
Petroleum Refineries	3	1,910,000	235,000	-	21,100	184,000	2,760,000	30,000
Pipeline Transportation	4	1,630,000	322,000	-	-	322,000	4,830,000	-
Power Plants	21	23,500,000	2,240,000	366,000	5,720	1,370,000	20,600,000	863,000
Waste Management	1	63,393	4,322	-	-	4,322	64,830	-
TOTAL	97	50,935,000*	3,936,000	1,025,000	151,000	2,872,000	43,074,000	914,000

Entries rounded to three decimal places, totals rounded to nearest 1,000 tonne.

* Excludes facilities whose emissions are deemed confidential.

^ Excludes Industrial Process and CO₂ from biomass.

Disclaimer:

The information contained in this report has been obtained from several different sources. Effort has been made to ensure its validity, but the authors cannot guarantee the correctness of data. Decisions based on the contents of this report are solely at the discretion of the reader. The greenhouse gas data collected under the *Specified Gas Emitters Regulation* is current as of October 6, 2010. Emissions values have been rounded. All emissions numbers reported in this document are in carbon dioxide equivalent units.

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ISBN: 978-0-7785-9964-7 (Printed)
ISBN: 978-0-7785-9965-4 (On-line)

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